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ABSTRACT

A study explored the possibility for the use of a modification of the Stroop test (a cognitive instrument that relies on the production of spontaneous responses) as a selection screening instrument in programs for students with public speaking anxiety. Subjects, 44 students in the special public speaking anxiety sections and 63 students enrolled in standard sections of speech communication, were individually administered the Stroop test. Participants were also given a large battery of paper/pencil instruments as pre- and post-tests. Results indicated that the test was able to differentiate between the students in the special sections of the basic speech communication course for students with public speaking anxiety and students in the standard sections. Findings suggest that the Stroop test could be used as a screening tool for cognitive measurement of public speaking anxiety. (Contains 17 references and 1 figure of data.) (RS)

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Using a Unique Cognitive Approach - A Variation of the Stroop Test - in the Identification and the Measurement of Public Speaking Anxiety

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Using a Unique Cognitive Approach - A Variation of the Stoop Test - in the Identification and the Measurement of Public Speaking Anxiety

The problem of public speaking anxiety and apprehension is one that is faced by as many as 20% of university students. Offering special sections of the basic speech communication course to help students cope with public speaking anxiety is an option in speech communication programs. Since space is often limited, it is important to provide opportunities for students who have the most problems; appropriate selection is not always simple. A modification of the Stroop test was used in this study to explore possibilities for its use as a student selection screening instrument in programs for students with public speaking anxiety. This test is not a verbal report instrument; it is a cognitive instrument that relies on the production of spontaneous responses. In this study, the Stroop test was successfully able to differentiate between the students in special sections of the basic speech communication course for students with public speaking anxiety and students in the standard sections. Results indicated that the Stroop test could be used as a screening tool for cognitive measurement of public speaking anxiety in this academic setting.

"I feel nauseated. I feel that I have inhaled all the air left on earth. I was humiliated speaking once in high school, and I will never live it down."

"There are several physical signs for me: first my hands get sweaty, and then my stomach twists into a giant knot. Top it off with an indescribable warm, sometimes hot, sensation throughout my body and, there you have it, the most awkward speaker in the world. I worry about choking on my tongue and drooling."

Written Comments From Students in a Regular Section of the Basic Speech Communication Course at the Beginning of the Semester

The problems connected with public speaking anxiety and apprehension are ones which face as many as 20% of university students (McCroskey, 1977). Taking the standard, frequently required, section of the basic speech communication course is often avoided and feared by students. For some students, the emotional trauma involved from presenting speeches can cause hurt and problems which will be long remembered. Avoidance of future speaking opportunities may be the result.

As instructors in the basic speech communication course, it is easy to concentrate on performance and content and to not address students' public speaking anxieties. Since, in most cases, some individual anxiety improvement takes place over the course of the semester, one might conclude that public speaking anxiety is something that students overcome with practice. But this is not always the case. Offering a special section of this course is one alternative option which can benefit students with public speaking anxiety. Starting up a program, and selecting the appropriate students, is not a simple task.

In 1982, Karen Foss presented information on programs that were in place at that time (Foss, 1982). Since then, information on where programs exist and how many are ongoing is sketchy at best. Models for programs that will fit individual university and college needs are difficult to find. Programs often start and stop based on the opportunities of individual instructors who might be dedicated to this endeavor. To teach in this type of program requires special training, and, if the 20% of students cited were to be included, it would take many instructors in large programs. Many programs rely on graduate teaching assistants to teach the basic speech communication course and much extra training would be necessary.

In addition to the teaching of such a program, selection of appropriate students is important. If programs only offer limited special sections, reaching the 20% of students with public speaking anxiety can be a problem. Students can be selected by interviews and by highly validated self-select instruments such as the PRCA 24 and the PRPSA (McCroskey & Richmond, 1992). Given the limited number of spaces available, however, a cognitive task approach would be one more check for finding the most anxious students.

After two years of research, using seven self-select testing instruments and the Stroop test (a new selection instrument to this discipline), interesting results were obtained. Using the Stroop test, for future selection of appropriate students, for "special" sections of the basic speech communication course, seems to be a viable option.

The Stroop Test

In the field of psychology, there is a method which has received much attention in the last ten years: the cognitive psychology method named the Stroop color-naming test (Stroop, 1935). One of the most comprehensive review articles, of three since 1966, was written by MacLeod (1991). The original source for the Stroop test was in the work of James McKeen Cattell (1886). Cattell reported that it took a longer time to color-name patches aloud than the corresponding words took to read aloud (example: saying red to a color patch was slower than saying red to the word red). There is still no universally accepted theory that is accepted to explain Cattell's observation (MacLeod (1991).

In 1935, John Ridley Stroop was the first one to combine the colors and words into a single task. Since then, well over 700 manuscripts have been published which either use or modify this original methodology (MacLeod, 1991). In his famous article (Stroop, 1935), Stroop included three experiments; his interest was on how to explain the cognitive interference. In his search for a theoretical explanation of the phenomenon, he offered his own interpretation for the data:

> The associations that have been formed between the word stimuli and the reading response are evidently more effective than those that have been formed between the color stimuli and the naming response. Since these associations are products of training, and since the difference in their strength corresponds roughly to the difference in training in reading words and naming colors, it seems reasonable to conclude that the

> difference in speed in reading names of colors and in naming colors may be satisfactorily accounted for by the difference in training in the two activities (Stroop, 1935, 659-660).

The Stroop (1935) test has been modified and used in recent years to evaluate cognitive interference due to fear by comparing individuals' color naming times for anxiety producing words to their times for neutral matched control words (Logan & Goetsch, 1993). The Stroop interference effect can be observed when individuals take longer times in color-naming words, which cause them anxiety than with neutral words. There can also be a facilitation effect which is when individuals name stimulus words more quickly than neutral words (MacLeod, 1991). **Individuals seem to automatically process word meaning in spite of their attempts to ignore it.** The effects of Stroop interference have been observed in a wide variety of fears and anxieties, in the clinical and the nonclinical settings (Logan & Goetsch, 1993; McNeil et al., in press).

Boone, Lewin, McNeil and Kahle (1989) developed a speech Stroop test measuring speech anxiety using context words. This speech Stroop test was used as an instrument to measure public speaking anxiety, in a special section of the basic speech communication course, at a large midwestern university, in 1993 and in 1994 (Turk, et al, 1994; Mandeville et al., 1994).

Method

Subjects

The participants were 153 students who were enrolled in basic speech communication classes. These students were from two sections for students with public speaking anxiety (two different spring semesters) and from 3 standard sections, standard sections of the speech communication course from two spring semesters.

Forty-six students were excluded from the study for not meeting participation requirements which were required for the Stroop test: color-vision deficits (n = 2); needed prescription glasses or contact lenses not worn during the Stroop task (n = 17); reported a history of seizures (n = 2); not in attendance the day of the Stroop screening (n = 8); English not a first language (n = 13); administration problems during the Stroop test (n = 3); more than four standard deviations older than the rest of the sample (n = 1). In all, 18 students (29%) were dropped from

the public speaking anxiety sections and 28 students (31%) were dropped from the standard sections.

Of the 107 students who remained, 44 (26 female) were enrolled in the public speaking anxiety sections and 63 (26 female) were enrolled in standard sections of speech communication. In terms of sample ethnicity, 4 were African-American, 94 were Caucasian, 2 were Hispanic, and 7 were Native American. Age was significantly greater in the speech anxious classes ($M = 21.8$, $SD = 4.6$, range = 18 - 39) than in the standard classes ($M = 20.1$, $SD = 2.6$, range = 18 = 36), $t(61.7) = 2.17$, p .05. A t-test for unequal variances was conducted due to the differences in variance between the two groups, $F(43,62) = 3.21$, p .0001.

Materials and Equipment

There were three Stroop test cards used. All cards displayed five words, which appeared 20 times each, for a total of 100 stimulus words per card. The words were printed in five colors (red, blue, green, yellow, and white) on an 11 16 black background. Colors and words were arranged in a random order, with the exception that no color or word could immediately follow itself in a column.

One card contained neutral stimuli words (e.g., cloth) and was used as a practice card. The other two cards were the Specific Speech Stimuli Stroop Test (audience, presentation, public, speech, stage) and its control test (elephant, subdivisions, nature, clouds, roads). The control words were matched with the anxiety words for number of letters and number of syllables, and frequency of word usage (Carrol, Davies, & Richman, 1971). Interference/facilitation indices were calculated by taking the time to color-name the Specific Speech Stimuli Stroop Test and by subtracting the time to color-name its control test.

Procedure

The data were collected during the spring semester for two consecutive years. Only one public speaking anxiety class was taught each year. One standard class was tested the first year and two standard classes were tested the second year. Students were individually administered the Stroop test on the first day of class by trained experimenters, in small rooms. Standardized directions were given to each participant. The practice card was administered first to ensure that participants understood the directions. The Specific Speech Stimuli Stroop test and its

control test were presented next; their orders were counterbalanced to control for order of presentation.

The participants were given a large battery of paper/pencil instruments during the second class period. In all, 7 instruments (4 from the speech communication discipline; 3 from the psychology discipline), with 176 item responses, were administered. These were gives as pre and post instruments.

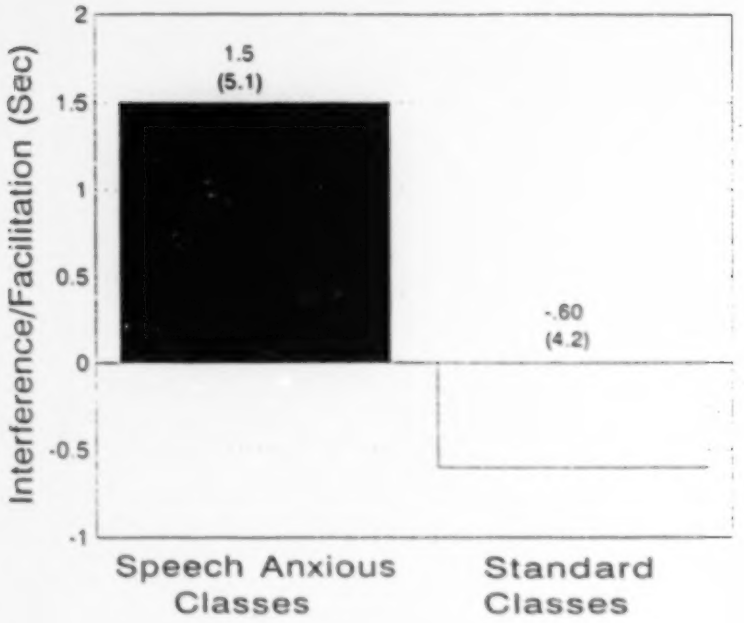
Results

There were several factors included in the design for all analyses. Gender was included as a factor because of the frequently found differences between males and females in research on verbal reports of fear and anxiety (Arrindell, Kilk, Pickersgill, & Hageman, 1993). The use of age as a covariate was used because of the differences in age between groups and because age can be a factor which influences Stroop test performance (MacLeod, 1991). Anxieties and fears have also been shown to change with age (Agras, Sylvester & Oliveau, 1969).

Group by gender analyses of covariance (ANCOVA's) were conducted on the Stroop interference/facilitation scores. There was a group main effect for interference/facilitation time, $F(1,102) = 5.02$, p .05. As expected, means for the speech anxious classes ($M = 1.4$) were significantly greater than those for the standard classes ($M = -0.7$). In fact, the difference score for the standard classes was actually in the direction of facilitation. **Figure 1** illustrates these differences. Neither the interaction nor the gender main effect reached significance.

Figure 1

Unadjusted means and standard deviations for interference/facilitation scores across groups.



Discussion

The cognitive assessment method, the Stroop test, was successfully able to differentiate between the students in the standard section of the basic speech communication course and the regular section of the basic speech communication course. These data, like those of MacLeod and Hagan (1992) and Holderby et al. (1992), provide an example of the usefulness of extending the Stroop test paradigm in a naturalistic sample.

The results provide support for the usefulness of the Specific Speech Stimuli Stroop Test as a part of the screening of students for special sections of the basic course for students with public speaking anxiety. Potential usefulness of the Stroop test, as a cognitive measure of public speaking anxiety, is indicated in this study.

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